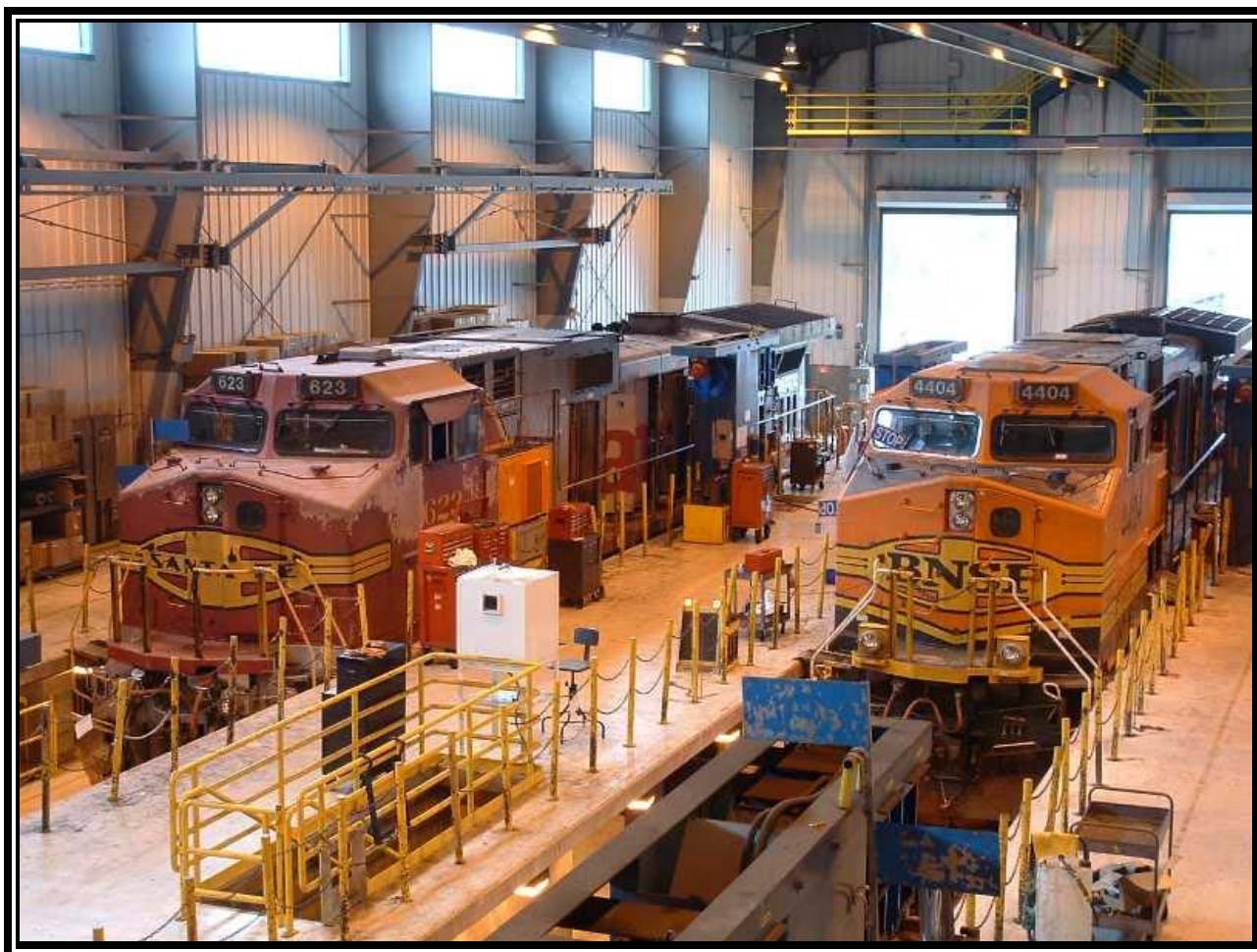


California Environmental Protection Agency



Air Resources Board

Update on the Implementation of the 2005 ARB/Railroad Statewide Agreement



(BNSF Sheila Mechanical Facility – Commerce CA)

Release Date: July 7, 2006

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**State of California
California Environmental Protection Agency
AIR RESOURCES BOARD
Stationary Source Division**

**Update on the Implementation of the
2005 ARB/Railroad Statewide Agreement**

**Date of Release: July 7, 2006
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I. SUMMARY

A. Introduction

On June 24, 2005, the Executive Officer of the Air Resources Board (ARB or Board) entered into a statewide railroad pollution reduction agreement (Agreement) with Union Pacific Railroad (UP) and BNSF Railway (BNSF). This Agreement was developed to implement near term measures to reduce diesel particulate matter emissions (DPM) in and around railyards by approximately 20 percent.

In response to concerns about the Agreement, the Board conducted two public meetings. On October 27, 2005, the Board received a staff report and public testimony about the Agreement. At this meeting, the Board directed staff to return to the Board in January with clarifications to the Agreement and a six-month status report on its implementation. The Board also emphasized the need for staff to continue its efforts to work with railroads, community members, and local air districts in connection with railyard emissions. On January 27, 2006, the Board heard a second presentation on the Agreement and took more public testimony. The Board also directed staff to return with status reports every six months. This document provides an update on the implementation of the Agreement with a particular emphasis on those efforts that have occurred over the past six months.

B. Progress on the Implementation of the Agreement

Staff and the railroads began implementing the Agreement in July 2005. A summary of the status of the key implementation requirements is provided in Table 1. As Table 1 illustrates, the railroads and ARB staff have met, or are on schedule to meet, each of the requirements specified for the first year of implementation. Details on the progress made to implement the programs elements are provided in Chapter II. Details on other efforts are provided in Chapter III. The Agreement required that community meetings occur at the designated railyards by November 1, 2005. Some of these community meetings were delayed in response to requests from community members and local air districts to postpone these meetings until after the Board fully considered the Agreement. After the January board meeting, the remaining community meetings were scheduled. All were held by June 14, 2006.

1. Implementation Activities

Summarized below are the key implementation milestones that have been accomplished within the past six months.

Install Idle Reduction Devices on 35 Percent of Unequipped Intrastate Locomotives by June 30, 2006:

- Since June 30, 2005, 113 new idle reduction devices have been installed on UP and BNSF's California-based locomotives, representing 35 percent of the unequipped intrastate locomotive fleet.
- To date, a total of 230 out of the 438 intrastate locomotives are now equipped with idle reduction devices, which represents 53 percent of California's intrastate locomotive fleet. This is almost twice the rate of installations that have occurred to date in the rest of the country.

Dispense CARB Diesel for all Intrastate Locomotives and a Minimum of 80 Percent Low Sulfur Diesel for Locomotives by January 1, 2007:

- Both railroads are currently on schedule to comply with the CARB diesel fuel regulation for intrastate locomotives by January 1, 2007.
- Both railroads expect to comply with the Agreement's requirements to dispense a minimum of 80 percent low sulfur (15 ppmw) diesel fuel prior to the January 1, 2007 compliance date.
- ARB staff estimate that both railroads' will dispense at least 90 percent or greater volumes of low sulfur (15 ppmw) diesel fuel on or after January 1, 2007.

Visible Emission Reduction

- More than 8,300 visible emission inspections were performed in the first six months of this calendar year. Both UP and BNSF are at the 99 percent compliance rate for the first six months of this year.
- Over the past six months about 1,600 employees have received visible emission evaluation training. Overall, about 4,400 employees in numerous classifications (e.g., managers, supervisors, dispatchers, etc.) have received visible emission evaluation training.

Identification of Mitigation Measures for Reducing Risks at Designated Yards

- In the meetings with community representatives, the railroads identified mitigation measures that were being undertaken at specific railyards. These include: early retrofitting of idle reduction devices; early use of CARB diesel and low sulfur diesel fuels for intrastate and interstate locomotives; introduction of new technology locomotives (e.g., liquefied natural gas, electric hybrid, and gen-set); and railyard equipment upgrades. In addition, UP is continuing to evaluate potential solutions to the traffic flow problem at its Mira Loma railyard.

Health Risk Assessments at Designated Yards

- Under the Agreement, sixteen new health risk assessments at designated railyards are to be completed by December 31, 2007. To facilitate this, draft health risk assessment guidelines were submitted to the local air districts for comments. The health risk assessment guidelines were released to the public in July 2006 and public workshops will be held in August.
- The railroads are developing emission inventories for the first nine railyards and should start submitting inventory data to ARB staff this fall.

Locomotive Remote Sensing Pilot Program

- In response to Assembly Bill 1222, the ARB, in consultation with an advisory group including representatives from the railroads, South Coast Air Quality Management District, Sacramento Metropolitan Air Quality Management District, and environmental groups are in the process of developing and conducting a remote sensing pilot program for locomotives. The first phase of the tests are expected to commence in the third quarter of 2006.

Ongoing Evaluation of Other, Medium Term, and Longer Term Emission Control Measures

- In 2001, staff and the railroads agreed to cooperatively evaluate the feasibility of developing diesel particulate filters or diesel oxidation catalysts for use on a typical locomotive representative of the current California switcher fleet. UP and BNSF indicated they would commit up to \$5 million towards this evaluation. About \$1.5 million of this funding was expended on prototype testing at Southwest Research Institute. The railroads jointly submitted an evaluation of this effort, as required under the Agreement, by December 31, 2005. The next steps for this effort include the following:
 - Both BNSF and UP have agreed to retrofit one southern California switch locomotive each with a diesel particulate filter configuration no later than December 1, 2006.
 - SwRI will evaluate the performance of the retrofitted devices during the second half of 2006.
 - If the in-use demonstration is successful, both UP and BNSF have committed to retrofit one additional locomotive each.
- Also, the U.S. EPA and UP recently announced plans to collaborate on a test program to use a diesel particulate filter and diesel oxidation catalyst with a switch and a line haul locomotive by:
 - Retrofitting a 3,800 horsepower line haul locomotive, built in 1992, with a diesel oxidation catalyst. In-use durability is planned in the Los Angeles area for approximately one year starting in mid 2006.

- Roseville Hood Project – Located in UP's railyard in Roseville, California, this project is designed to mitigate local emissions from large railyards or test facilities. The project will provide substantial reductions in pollutants where large numbers of locomotives may congregate and idle or move slowly in congested areas of a railyard.
- ARB and the railroads conducted the first semi-annual technology symposium on April 25, 2006, at the ARB offices in El Monte. The second symposium is scheduled for July 13, 2006, at the Cal/EPA building in Sacramento.
- In May 2006, representatives of the ARB, South Coast Air Quality Management District, General Electric Transportation Rail, Caterpillar, UP, Miratech Corp. (U.S. Representative for HUG), and Southwest Research Institute (SwRI), traveled to Switzerland to meet with HUG Engineering. HUG Engineering is a leading supplier of after treatment devices especially for locomotives and marine engines. The purpose of the trip was gain a better understanding of the European rail infrastructure and current efforts regarding retrofits of locomotives with after treatment devices (e.g., diesel particulate filters and diesel oxidation catalysts).
- At the community meetings, the railroads also discussed efforts to develop medium term and longer term emissions control measures including the status of diesel particulate filters for locomotives.

Enforcement of the Agreement

- Since February 2006, the ARB Enforcement Division staff have trained 45 ARB and air district staff to conduct railyard inspections prerequisite to going into the field.
- The Enforcement Division staff visited 31 designated and covered railyards and inspected 675 locomotives. As a result of these inspections, ARB staff issued 23 notice of violations for idling infractions and one notice of violation issued for a smoking locomotive. This is about a 96 percent compliance rate for the locomotives sampled.

2. Other Activities

As discussed in Chapter III, ARB staff and the railroads have been engaged in activities not specifically required in the Agreement. These are summarized below.

Modernization of Locomotive Fleet

Mostly in response to the 1998 Railroad Agreement to reduce locomotive NO_x emissions in the South Coast, both UP and BNSF have made a strong commitment to

advanced technology line-haul and switch locomotives that have or will operate in California. Together, they have done the following:

- Purchased nearly 4,000 new Tier 0, 1, and 2 locomotives since 2000 (most installed with built-in idle reduction devices). Of those nearly 700 are Tier 2 locomotives.
- Operated four switch locomotives retrofitted to burn liquefied natural gas in southern California since the mid 1990's.
- Since 2005, 12 new electric-hybrid locomotives (Green Goats) have been purchased; four have already been placed in-service and the remaining eight Green Goats are expected to arrive in the second half of 2006.
- UP ordered sixty new gen-set switch locomotives which are scheduled to arrive between late 2006 and early 2007. By mid-2007, an additional nine gen-set switch locomotives are anticipated to be located in northern California for both BNSF and UP which were co-funded under ARB's Carl Moyer Program.
- As compared to the replaced older switch locomotives, the ultra low-emitting switch locomotives will provide about a 90 percent reduction in NOx and DPM emissions.
- The 81 new gen-set and Green Goat switch locomotives represent a replacement of nearly 20 percent of California's 438 intrastate locomotive fleet by late 2007. The balance will be upgraded to comply with the 1998 MOU by 2010.

Designated and Covered Railyard Visits

- ARB staff completed visits to all of the designated railyards by March 2006 and visited seven covered railyards this past spring. The purpose of these visits was to observe overall operations, the relative level of activity, and the proximity of residences and other businesses to each railyard so that risk reduction measures could be more directly targeted at the characteristics of each railyard.

Community Complaint Process

- Both railroads have established and implemented procedures to process, handle, and respond to community complaints. The systems operate 24 hours a day and 365 days a year. Mechanisms are in place to track and forward complaints to appropriate company staff to respond.

Other Outreach Efforts

- In addition to the community meetings required under the Agreement, the railroads have initiated a number of other outreach activities and events with the public. These include conducting meetings with local community groups to educate them on operations in local railyards and conducting meetings to introduce new locomotive technologies to community representatives. Some recent examples over the past year include:
 - At BNSF Commerce railyard, a demonstration of a green goat electric-hybrid locomotive, a Tier 2 locomotive, and idle reduction equipment used on locomotives; and
 - A tour of the UP Oakland railyard for community members.

Table 1
Implementation Status of Individual Program Elements
 (Thru June 30, 2006)

PROGRAM REQUIREMENTS	2005					2006			
	JUL 31	AUG 31	SEPT 30	OCT 31	DEC 31	JAN 31	APR 30	JUN 30	JUL 31
IDLING REDUCTION									
Program Coordinators	✓								
Locomotive Inventories		✓					✓		
Community Reporting Process		✓							
Railroad Training Programs			✓						
Adjudicatory Appeal Process			✓						
Training Implementation Status				✓			✓		
35 percent Idle Devices								✓	
VISIBLE EMISSION (VE)									
Program Coordinators	✓								
Program Establishment		✓							
Community Reporting Process		✓							
Railroad Training Programs			✓						
VE Inspection Report			✓				✓		
Training Implementation Status				✓			✓		
Annual Program Review									Anticipated
EARLY REVIEW OF EMISSIONS/MITIGATION									
Emission Inventory				✓					
Community Meetings <i>(Due Date 10/31/05)</i>				Due Date				✓	
Mitigation Plans					✓				
HEALTH RISK ASSESSMENTS									
Railroad Study Plan			✓						
Health Risk Assessment Guidelines									✓
TECHNICAL ASSESSMENTS									
Continue Study of Diesel Particulate Filter and Diesel Oxidation Catalysts				✓					
Diesel Particulate Filters and Diesel Oxidation Catalysts Use - Europe & U.S.					✓				
Remote Sensing Pilot Program					✓				
Public Meetings <i>(Due Date 12/31/05)</i>					Due Date		✓	✓	
Joint Report on Public Meetings									Anticipated
COMPLIANCE									
Inspection Protocols					✓				
Program Review Protocol					✓				
ARB STATUS REPORTS						✓			✓

✓ Denotes completed. "Due Date" is the original compliance date for late submittals. "Anticipated" is date requirement its expected to be completed.

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II. UPDATE ON THE IMPLEMENTATION OF THE AGREEMENT

Staff and railroads began implementing the Agreement in July 2005. As presented in Table 1, the railroads and staff have met all of the requirements that are specified for the first year of implementation of the Agreement. Key program elements are:

- Idle Reduction Program;
- Low Sulfur Diesel Fuel Program;
- Visible Emission Reduction Program;
- Identification of Mitigation Measures for Reducing Risks at Designated Railyards Program;
- Health Risk Assessments at Designated Railyards Program;
- Ongoing Evaluation of Other, Medium-Term, and Longer-Term Emission Control Measures.

This chapter more fully describes the progress made to date.

A. Idle Reduction Program

1. Requirements of the Agreement

Under the Agreement, intrastate and interstate locomotives must limit non-essential idling through the use of automated idle reduction devices or by manually shutting down engines to prevent non-essential idling in excess of 60 consecutive minutes. Essential idling is defined as idling necessary to:

- Ensure adequate air brake pressure for locomotive and railcars;
- Ensure other safety related purposes;
- Prevent freezing of engine coolant;
- Ensure compliance with federal guidelines for occupied locomotive cab temperatures; and
- Engage in necessary maintenance activities.

The Agreement also provided railroads with the option to expand the essential idling list, if necessary and appropriate, by September 1, 2005. Neither railroad submitted a request for an expanded list of essential idling.

The preferred method of all parties to reduce non-essential idling is the use of automated idle reduction devices. Under the Agreement, where locomotives are equipped with idle reduction devices, non-essential idling is limited to no more than 15 consecutive minutes. For locomotives not equipped with idling reduction devices, locomotives are to be shutdown as soon as it is clear that essential idling is not required, and in no case, is non-essential idling to exceed more than 60 consecutive minutes. In those situations where there is uncertainty over the expected duration of idling, the railroads are obligated to make efforts to notify their train crews if the

anticipated wait time could be greater than 60 consecutive minutes so that train crews can shut down their locomotive(s). Railroad training programs are required to inform and educate train crews and other railroad operational employees about the need to faithfully observe the restrictions on idling.

2. Intrastate Locomotive Inventories

The initial inventories of California intrastate locomotives were submitted by both UP and BNSF by September 1, 2005. In addition, both railroads submitted the required initial annual updates to these inventories by April 2006 as required in the Agreement. As can be seen in Table 2, as of June 30, 2006, the railroads have identified 438 intrastate locomotives that are captive to California. The intrastate locomotive inventories have been posted on the ARB railyard website under "Railroad Submittals" (www.arb.ca.gov/railyard/ryagreement/rsubmittal.htm).

3. Installation of Idle Reduction Devices

The railroads are on schedule to meet their commitments to install idle reduction devices on their intrastate locomotive fleet. Based on the information provided by the railroads, of the 438 intrastate locomotives operating in the State, 117 were equipped with idle reduction devices prior to June 30, 2005. Under the provisions of the Agreement, the remaining 321 must be equipped by June 30, 2008. The Agreement requires both railroads to install idle reduction devices on 35 percent of the unequipped intrastate locomotives, or 112 locomotives, by June 30, 2006. The railroads installed idle reduction devices on 113 intrastate locomotives over the past year.

As can be seen in Table 2, 53 percent of the 438 intrastate locomotives (switch and local locomotives) in California operation are equipped with idle reduction devices. This is almost twice the rate of installations that have occurred to date in the rest of the country. Staff expects that the Agreement will ensure that progress in California is accelerated relative to the rest of the nation.

Table 2
Installation of Idle-Reduction Devices in California Switcher and Local Locomotives Relative to National Fleet

California Switcher & Local Fleet			National Switcher & Local Fleet		
Current Inventory	Installed By June 30, 2006	Percent of Fleet*	Current Inventory	Installed By June 30, 2006	Percent of Fleet*
438	230	53%	3,560	1,008	28%

4. Idle Reduction Training Programs

Both railroads have submitted copies of their idle reduction training programs, and their plans to train appropriate railroad staff on the idling provisions and locomotive shutdown requirements of the Agreement. Staff has reviewed and approved the key elements of the railroads' idle reduction training programs. To highlight the new policies, UP has developed a company brochure entitled "The Lowdown on the Shutdown". Both railroads have developed more intensive training for train crews to be conducted as part of the annual safety training they must complete under Federal Railroad Administration regulations. Information on the railroads' idle reduction training programs and UP's "The Lowdown on the Shutdown" brochure are posted on the ARB railyard website under "Railroad Submittals" (www.arb.ca.gov/railyard/ryagreement/rsubmittal.htm).

Both railroads have begun the process of training locomotive operators and other appropriate railroad employees on the idling provisions and requirements of the Agreement. UP and BNSF combined plan to provide about 6,000 railroad employees, primarily located in California, with the necessary training. Since some employees, such as dispatchers and potentially some train crews, are impacted by the Agreement but may not be stationed in California, a significant number of railroad employees outside of California that have also been trained on the idling provisions and requirements of the Agreement is included in this total. The number of railroad employees that have been trained or have been scheduled for training by June 30, 2006, is provided in Table 3.

Table 3
Number of Railroad Employees Trained Regarding
the Idle Reduction Program

Employee Classification	Idle Training by 06/30/06
Managers	129
Supervisors	75
Dispatchers	42
Response Center	21
Train Crews	3,433
Mechanical	700
Other	2
Total Trained	4,402

B. Low Sulfur Diesel Fuel Program

Under ARB regulations approved in November 2004, both railroads are required to dispense only CARB diesel fuel for intrastate locomotives by January 1, 2007. Under the Agreement, the railroads agreed to dispense a minimum of 80 percent of low sulfur levels (15 ppmw) diesel fuels, either CARB or U.S. EPA onroad, to locomotives fueled in California. This low sulfur diesel fuel requirement is also effective on January 1, 2007.

Both railroads indicated they are currently on schedule to meet the CARB diesel regulation requirements for intrastate locomotives by January 1, 2007. In addition, both railroads expect to comply with the Agreement's requirements to dispense a minimum of 80 percent low sulfur (15 ppmw) diesel fuel to locomotives fueled in California prior to the January 1, 2007 compliance date. ARB staff estimates that both railroads' will dispense at least 90 percent or greater volumes of low sulfur (15 ppmw) diesel fuel on or after January 1, 2007.

C. Visible Emission Reduction Program

1. Requirements of the Agreement

Under the Agreement, UP and BNSF must establish a visible emission reduction and repair program that will ensure a 99 percent compliance rate for locomotives operating within the State. The program must include the following key elements:

- Annual inspections of all locomotives that operate in California through the use of an opacity meter or a certified Visible Emissions Evaluator (VEE), and an additional number of locomotive inspections to ensure compliance with the performance standard;
- Identification of locomotives with exhausts exceeding a steady state opacity measurement of 20 percent;
- Within 96 hours of inspection of locomotives identified with exhausts exceeding 20 percent opacity, the locomotive must be repaired as appropriate to meet the applicable federal locomotive visible emission certification standard before they can be returned to service; and
- Annually provide a report on the total number of visible emissions inspections conducted by each railroad and the results of those inspections.
- If, in any calendar year, a participating railroad's visible emissions compliance rate is less than 99 percent, the affected railroad and ARB will meet to agree on additional measures necessary to return the locomotive fleet to the performance standard.

The visible emission requirements do not affect pre-existing and continuing state or local authority or prerogatives to issue notice of violations for noncompliance with nuisance and opacity provisions in the Health and Safety Code Sections 41700-41701.

2. Visible Emission Reduction and Repair Plans and Programs

Both UP and BNSF submitted the required plans to establish their visible emission reduction and repair programs on schedule. The plans submitted by the railroads specify the number of visible emission inspections that they propose to perform annually. The plans also identify the procedures that will be implemented to identify, inspect, and repair locomotives with excessive visible emissions.

The railroads have been conducting visible emission inspections over the past year as specified under their visible emission reduction and repair programs as shown in Table 4. Locomotives operating in California and exceeding a steady state opacity measurement of 20 percent must be sent to maintenance facilities to determine whether repairs are needed to comply with applicable visible emission standards as set forth in the national railroad regulation.

Under the Agreement, the railroads are required to achieve a 99 percent compliance rate for visible emissions over a calendar year. The railroads became subject to the opacity compliance level on January 1, 2006. Over the first six months of calendar year 2006, both UP and BNSF are at the 99 percent compliance rate. The visible emissions inspections results for the first half of this calendar year can be seen in Table 4.

Table 4
Results of Visible Emission Inspections
Performed January 1-June 30, 2006

First Six Months of Calendar Year 2006	Certified Opacity Meter	Certified U.S. EPA Method 9 *	Number with Opacity > 20%	Compliance Rate
UP	35	6,129	35	99%
BNSF	N/A *	2,204	33	99%
Total	35	8,333	68	99%

* BNSF performed opacity testing but was unable to match opacity testing data precisely with the opacity > 20% data.

3. Visible Emission Reduction Training Programs

Similar to the idle reduction program, both railroads have submitted information on the development of their visible emission reduction and repair training programs, and their plans to train appropriate railroad staff regarding the programs. Both railroads have been conducting their training programs over the past year. The railroads have indicated they intend to train the same staff (i.e., managers, supervisors, dispatchers, response center, train crews, mechanical, and other) as trained on the provisions of the idle reduction program. Information on the railroads' visible emission reduction and repair training programs has been posted on the ARB railyard website under "Railroad Submittals" (www.arb.ca.gov/railyard/ryagreement/rsubmittal.htm).

The number of employees trained by June 30, 2006, by employee classification, for both railroads is shown in Table 5. Employees outside of California are also being trained because they either work with or operate locomotives that operate in the State.

Table 5
Number of UP and BNSF Employees Trained
July 2005-June 2006

2005-2006	Certified U.S. EPA Method 9	Non-Certified VE Training	General Awareness Training
2005	114	448	2,774
2006	128	205	1,588
Total Trained	242	653	4,362

D. Identification of Mitigation Measures for Reducing Risks at Designated Railyards

1. Requirements of the Agreement

Under the Agreement, the railroads are required for each designated railyard to: 1) review air emissions, 2) determine if there are feasible changes, prior to the development of health risk assessments, that can be implemented to reduce the impacts of locomotive and associated railyard equipment emissions, and 3) share both the air emissions and potential mitigation measures information in community meetings at each of the designated railyards.

2. Review of Designated Railyard Emissions

Each railroad submitted air emissions information by November 1, 2005 for each of the designated railyards. The railroads submittals included information on the types of railroad operations, level of activity, nearby urban populations, estimate of air emissions, and a ranking of railyards by potential level of diesel particulate matter health risks. This information can be found at:

<http://www.arb.ca.gov/railyard/ryagreement/rsubmittal.htm>.

3. Potential Additional Mitigation Measures

As required in the Agreement, the railroads submitted a list of potential additional mitigation measures for each of the designated railyards by December 31, 2005. Potential mitigation measures identified by the railroads included: changes in operations at railyards; locomotive replacements or upgrades; expedited installations of idle reduction devices on locomotives; early use of cleaner fuels; and use of advanced emission control devices. These additional mitigation measures were discussed with the public at the designated railyard community meetings.

4. Community Meetings

Under the Agreement, community meetings were to be held by November 1, 2005 to discuss the air emissions estimates and potential mitigation measures for each of the designated railyards. Some community members and local air districts expressed a desire to postpone these meetings until the Board had conducted its public review of the Agreement, which did not occur until late October and continued to January. However, after the January Board meeting, the community meetings were held and completed by June 14, 2006. Table 6 shows the schedule in completing the community meetings.

**Table 6
Community Meetings**

Railyard	Operator	Date of Meeting
Barstow	BNSF	January 3, 2006
Commerce/Eastern (Including Commerce Sheila Mechanical)	BNSF	October 25, 2005
Hobart	BNSF	October 25, 2005
Richmond	BNSF	February 8, 2006
San Bernardino	BNSF	June 14, 2006
San Diego	BNSF	May 30, 2006
Stockton	BNSF	April 18, 2006
Watson	BNSF	October 25, 2005
Colton	UP	May 11, 2006
Commerce	UP	May 13, 2006
ICTF/Dolores	UP	May 17, 2006
Industry	UP	May 12, 2006
LATC	UP	April 24, 2006
Mira Loma	UP	May 9, 2006
Oakland	UP	February 7, 2006
Roseville	UP	January 17, 2006
Stockton	UP	April 13, 2006

E. Health Risk Assessments at Designated Yards Program

1. Requirements of the Agreement

Under the Agreement, 16 new health risk assessments at the designated railyards will be completed. The Agreement identifies which railyards are to be completed first and those that are to be completed within an additional year. Set dates for the draft assessments are not specified in the Agreement. However, the ARB and the railroads have agreed to a schedule that will produce draft risk assessments within 18 months and 30 months, respectively, from the date the Agreement was signed. The health risk assessments include emissions of toxic air contaminants (TACs) from emission sources at each designated railyard including resident and transient locomotives, on- and off-road equipment, and stationary equipment, and the associated health risk from on-site activities will be identified. In addition, staff will provide additional information on the risk from nearby off-site sources. In performing the health risk assessments, the railroads will collect and submit air emissions, meteorological, demographic, and air dispersion modeling data to ARB. Staff will complete the health risk assessments based on the data developed for each designated railyard.

2. Health Risk Assessment Guidance

To ensure that consistent data and methodologies are used, staff developed draft statewide guidelines for railyard health risk assessments. These guidelines were submitted to the affected local air districts for comments in June 2006 and were released to the public in July 2006. The guidelines will help ensure that the emission inventory development and air dispersion modeling performed for each railyard meet the requirements in the Agreement. The railyard health risk assessments will be consistent with the Air Toxic Hot Spots Program Risk Assessment Guidelines (Risk Assessment Guidelines) published by Office of Environmental Health Hazard Assessment (OEHHA), and be consistent with the Roseville Railyard Study performed by staff in 2004.

3. Schedule for Development of Health Risk Assessments

As mentioned above, ARB and the participating railroads have agreed that the draft risk assessments will be completed and available to the public within 18 months, or 30 months, respectively, from the date the Agreement was signed. Table 7 identifies the tentative schedule for completion of the health risk assessments at the 16 designated railyards. Emission data for the first nine railyards will start becoming available this summer.

Table 7
Tentative Schedule for Completing Health Risk Assessments

Draft Health Risk Assessments to be Completed by <i>December 31, 2006</i>		Draft Health Risk Assessments to be Completed by <i>December 31, 2007</i>	
Railyard	Company	Railyard	Company
Commerce/Eastern	BNSF	Barstow	BNSF
Hobart	BNSF	San Bernardino	BNSF
Richmond	BNSF	San Diego	BNSF
Stockton	BNSF	Colton	UP
Watson	BNSF	Dolores/ICTF	UP
Commerce	UP	Industry	UP
LATC	UP	Oakland	UP
Mira Loma	UP		
Stockton	UP		

F. Locomotive Remote Sensing Pilot Program

On October 6, 2005, the Governor signed Assembly Bill 1222. Under the provisions of AB 1222, the ARB is required to design and implement a remote sensing pilot program in consultation with an advisory group consisting of up to 14 specified members. These members were appointed by the South Coast Air Quality Management District, Sacramento Metropolitan Air Quality Management District, UP, and BNSF.

The objectives of AB 1222 are to determine whether remote sensing devices can accurately and reliably determine, with a reasonable level of precision:

1. The levels of nitrogen oxides, particulate matter, and carbon monoxide emissions from locomotives;
2. Whether a locomotive is subject to tier 0, 1, or 2 federal certification standards; and
3. Whether the measured results can be calibrated to determine compliance with applicable federal emission certification levels.

There have been 9 Advisory Group meetings through June 30, 2006. The ARB, in consultation with the Advisory Group, has developed a three phase approach towards implementing and achieving the objectives of this bill. Phase 1 involves an initial field test to determine the ability of remote sensing devices to measure the emissions from locomotive exhaust stacks. This will be implemented at the Transportation Technology Center Inc. in Pueblo, Colorado. Phase 2 includes installation of the remote sensing devices at several locations in Northern and Southern California and monitoring emissions of locomotives that travel through these monitoring locations. The objective of Phase 2 is to assess the ability of the devices to evaluate locomotive emissions in the real world. Phase 3 is designed to compare measurements from remote sensing devices against U.S. EPA locomotive certification emission testing pursuant to 40 CFR Part 92. This phase is designed to determine the accuracy and precision of remote sensing devices as compared with the measurement of locomotive emissions required under the federal locomotive test procedures.

The Phase 1 work in Pueblo, Colorado is expected to commence in late September or early October 2006. The Advisory Group has developed a list of siting locations and a final list is expected to be completed by August 2006. Phase 2 will use the remote sensing devices in the field and is expected to begin in September 2006. A Request for Proposal for Phase 3 work is being developed to solicit bids from vendors to conduct the locomotive certification emission testing. Based on the results of the pilot program, the ARB is required to prepare a report to the Legislature on the feasibility and cost-effectiveness of locomotive remote sensing technology by December 31, 2006.

G. Ongoing Evaluation of Other, Medium-Term, and Longer-Term Emission Control Measures

1. Requirements of the Agreement

Under the Agreement, the ARB and railroads agreed to continue to evaluate and implement any other feasible mitigation measures. These measures included, but were not limited to, funding of research of diesel particulate filter and oxidation catalyst studies and demonstrations for switch locomotives and additional measures to evaluate and demonstrate advanced technologies for locomotives and the use of alternative fuels. In addition, the ARB and railroads committed to conduct semi-annual technical evaluation meetings with the public to evaluate future potential emission reduction measures.

2. Diesel Particulate Filters and Oxidation Catalysts

In 2001, staff and the railroads agreed to cooperatively evaluate the feasibility of developing diesel particulate filters or diesel oxidation catalysts for use on a typical locomotive representative of the current California switcher fleet. UP and BNSF indicated they would commit up to \$5 million towards this evaluation. About \$1.5 million of this money has already been expended for prototype testing of a locomotive diesel particulate filter. Under the Agreement, a detailed description of the evaluation findings to date, as well as an assessment of the current application of this technology to locomotives in Europe, was to be completed. The railroads jointly submitted this information to ARB in December 2005.

The next step in the diesel particulate filter locomotive demonstration is in-use durability testing in California. As part of the demonstration, both BNSF and UP have agreed to retrofit one California switch locomotive each with a diesel particulate filter configuration no later than December 1, 2006. SwRI will evaluate the performance of the configuration during the second half of 2006. If the in-use demonstration is successful, both UP and BNSF have committed to retrofit one additional locomotive each for a total of four DPF switcher locomotives in California.

In a separate test program UP recently announced efforts to collaborate with the U.S. EPA to test older freight locomotives retrofitted with a diesel oxidation catalyst to reduce diesel particulate matter emissions. A 3,800 horsepower locomotive will be retrofitted with a diesel oxidation catalyst. This 3,800 horsepower line haul locomotive, originally built in January 1992, will be tested in the Los Angeles area for approximately one year starting in mid 2006. Switch locomotives in Europe (Switzerland and Germany) are also being retrofitted with diesel particulate filter technology and are in various stages of adaptation to different locomotive models.

3. Roseville Hood Project

Located in UP's railyard in Roseville, California, is the Roseville Hood Project. Designed to mitigate local emissions from large railyards or test facilities the project will provide substantial reductions in pollutants where large numbers of locomotives may congregate and idle or move slowly in congested areas of a railyard. It can accommodate up to eight side-by-side tracks, each with two locomotives per track idling or moving slowly, with coverage up to one mile. This system incorporates a selective catalytic reduction behind a scrubber which allows removal of sulfur dioxide and particulate matter prior to the gas stream entering the selective catalytic reduction. The pollutant reduction performance is 95 percent for oxides of nitrogen, 99 percent for particulate matter (PM₁₀, PM_{2.5} sub-micron, and PM_{1.0} ultra-fine), 99 percent for sulfur dioxide, and 50 to 90 percent for VOCs. Construction and testing of this emission control system is currently underway.

4. Symposiums to Evaluate Future Potential Measures

Under the Agreement, the ARB and railroads are required to conduct public semi-annual technical evaluation symposiums to identify and evaluate future emission reduction measures for locomotive and railyard emissions. The initial technical evaluation symposium was held on April 25, 2006 at the ARB offices in El Monte. This meeting included brief presentations and discussions by manufacturers on the capabilities of new and retrofitted idle reduction devices and advanced new switch locomotive technologies. The second symposium scheduled for July 13, 2006 at the Cal/EPA building in Sacramento is designed to provide information on advanced locomotive technology use and demonstrations in Europe and the United States, and research and development and demonstration projects. Under the Agreement, after the second symposium, the ARB and railroads are required to prepare a brief written report on progress and findings from the symposiums.

5. Trip to Switzerland to Evaluate Retrofits and Others

In May 2006, representatives of the ARB, South Coast Air Quality Management District, General Electric Transportation Rail, Caterpillar, Union Pacific, Miratech Corp. (U.S. Representative for HUG), and Southwest Research Institute (SwRI), traveled to Switzerland to meet with HUG Engineering. HUG Engineering is a leading supplier of after treatment devices especially for locomotives and marine engines. In addition, staff visited Swiss Rail (SBB), the VERT (Verbesserung der Emission, en von Realmas chinen in Tunnellbau) Facilities, and attended the American Society of Mechanical Engineers (ASME) conference on locomotive emissions. The purpose of the trip was to gain a better understanding of the European rail infrastructure and current efforts regarding retrofits of locomotives with after treatment devices (e.g., diesel particulate filters and diesel oxidation catalysts).

The Swiss rail system is mostly nationalized unlike the U.S. system which is predominately privately owned. Almost all of the track in Switzerland is electrified with overhead electric supply lines and about 99 percent of the line haul locomotives (about 1000) are electric. SBB operates between 700 and 800 diesel hydraulic drive locomotives rated between 670 to 2,700 horsepower and are used for maintenance, switch, and short haul activities. The diesel portion of the fleet is being downsized to about 450 locomotives and all will be equipped with diesel particulate filters. Most of the Swiss diesel locomotives are 4 cycle high revolution per minute (RPM) engines which results in a physically smaller engine than the American medium RPM engines. The smaller size facilitates the retrofitting of particulate filters. Finally, the line haul diesel locomotives in Switzerland usually pull smaller loads than comparable engines in the United States.

The VERT facility is located at the University of Applied Science in Biel. The VERT Program started as a project in 1993 to develop methods and procedures to confirm emission levels from diesel equipment operating in tunnels. The focus was on the efficacy of retrofitting various pieces of off-road equipment with particulate filters to protect workers. The project evolved to a standardized test procedure for after treatment control devices. The facilities include laboratories with chassis and engine dynamometers and dilution tunnels. The procedures developed at VERT are similar in approach to the ARB. However, VERT's procedures apply to discrete applications, such as marine or locomotives, whereas ARB procedures include consideration of whole engine families.

The HUG Engineering facilities include sales, design and manufacturing. HUG manufactures ceramic filters and housings for particulate traps including custom production. Diesel particulate filters and selective catalytic reduction (SCR) catalysts for oxides of nitrogen control are fabricated for various applications including diesel locomotives, marine engines, off-road equipment and stationary engines. HUG staff feels that diesel particulate filters and SCR should work on a wide variety of large engines. The main considerations are the space needed for the devices and support structure for their weight. This is especially critical for existing U.S. line haul locomotives, where space is severely limited for retrofit applications.

The 2006 American Society of Mechanical Engineers conference was held in Germany to discuss current locomotive emission control strategies and future emission standards. Also participating were representatives from the U.S. EPA, International Union of Railways, European Union, and Canada.

Experience gained from the current efforts in Switzerland to install diesel particulate filters and selective catalytic reduction for NOx control could be applied in the United States. However, locomotive design, horsepower, load and work cycles are not comparable to the United States except in certain applications.

Retrofitting existing United States switch locomotives has high potential for success, but only where space for the devices is available. There are also important considerations

in retrofitting a diesel particulate filter to an existing switch locomotive. A typical switch locomotive in California is on average 35 years old which is also old enough to be exempt from federal locomotive emission standards and remanufacturing requirements. The typical California switch locomotive is also a two stroke lower speed engine (versus the four stroke higher speed engines used in switch locomotives operated in Europe), and leaks significant amounts of lubrication oil through rings and cylinders that can plug or significantly reduce the efficiency of after-treatment devices. The planned testing and demonstration of diesel particulate filters on the UP and BNSF switch locomotives over the next year will provide additional information to assess the feasibility and cost-effectiveness of operating diesel particulate filters on switch locomotives in the United States.

Retrofitting existing United States line haul locomotives is probably not feasible without significant redesign and modifications. An existing pre-Tier 0 line haul locomotive is at least six years old and on average nationally about 15-20 years old. Existing line haul locomotives in the United States are also predominately two stroke engines, but they are on average about twice the horsepower of a switch locomotive (i.e., 4,000 versus 2,000 horsepower) . The planned testing and demonstration of diesel particulate filters on switch locomotives may provide important information on the feasibility and costs of retrofitting diesel particulate filters to existing line haul locomotives in the United States.

For the next generation of Tier 3 United States locomotives, the outlook is very promising to be able to include diesel particulate filters and selective catalytic reduction devices with adequate space built into their design. It is staff's view that the technology demonstrated in Europe can be successfully incorporated into the design of new line haul locomotives used in the United States. However, the emission standards to require these controls and locomotive redesigns in the future are dependent on the proposed federal Tier 3 locomotive rulemaking.

H. ARB Enforcement Training and Inspections

Consistent with the Agreement, ARB staff began development and implementation of an idling enforcement training program for ARB and local air district enforcement personnel, and coordination with the railroads to provide visible emission training to railroad employees. ARB staff conducted railyard inspections to evaluate compliance with the requirements specified in the Agreement.

1. Training

As part of the development of the idling and visible emissions enforcement training program, ARB Enforcement Division conducted training on the Agreement. This training includes:

- An overview of the Agreement, with a specific focus on the idling, visible emission, and fuel components;

- Information on the California intrastate locomotive fleet, including descriptive and visual information on “typical” intrastate locomotives; and
- Reviewing the railroads’ idling reduction and visible emission reduction and repair programs.

Training for the locomotive idling and visible emission enforcement program began in February 2006, and has been given to 45 ARB and local air district enforcement staff as of June 30, 2006. In addition, 13 UP and BNSF staff have participated in the training to improve their understanding of the ARB enforcement program. Staff is making preparations to train up to 60 Bay Area district staff in early August.

2. Inspections

ARB enforcement staff met with both railroads on March 23, 2006 to conduct a dress rehearsal or “white hat” inspection at UP Roseville. ARB staff observed and evaluated over 100 locomotives for idling and smoking violations. In the afternoon, ARB and railroad staff met in a conference to discuss those locomotives with potential violations and the process that would be used to issue Notices of Violations (NOVs). Based on this experience, both the ARB and railroad staff believed that they were prepared for the first set of railyard inspections. As a result, ARB staff began the process to identify and schedule inspections for all of the designated and covered railyards in the Spring of 2006.

The railyard inspections allowed ARB staff to evaluate the effectiveness of the Agreement and to identify needs for adjustments to the program elements. Tables 8 and 9 identify those designated and covered railyards which were inspected in the spring of 2006. ARB staff inspected the identified 31 designated and covered railyards from May 8-June 16, 2006.

During these inspections, ARB staff observed a total of 675 locomotives and issued 23 Notice of Violations for locomotives in violation of the Agreement idling requirements and one Notice of Violation for exceeding visible emission requirements. See Table 10 for a summary of the data.

Table 8
Designated Railyard Inspections

Railyard	Operator	Date of Inspection
Barstow	BNSF	May 10, 2006
Commerce/Eastern (including Commerce Mechanical)	BNSF	June 12, 2006
Hobart	BNSF	June 12, 2006
Richmond	BNSF	June 9, 2006
San Bernardino	BNSF	May 31, 2006
San Diego	BNSF	June 1, 2006
Stockton	BNSF	May 8, 2006
Watson	BNSF	June 13, 2006
Colton	UP	June 14, 2006
Commerce	UP	June 12, 2006
ICTF/Dolores	UP	June 13, 2006
Industry	UP	June 5, 2006
LATC	UP	June 13, 2006
Mira Loma	UP	June 6, 2006
Oakland	UP	May 11, 2006
Roseville	UP	May 9, 2006
Stockton	UP	May 8, 2006

Table 9
Covered Railyard Inspections

Railyard	Operator	Date of Inspection
Bakersfield	BNSF	May 11, 2006
Fresno (Calwa)	BNSF	May 18, 2006
La Mirada	BNSF	May 30, 2006
Needles	BNSF	May 11, 2006
Pico Rivera	BNSF	May 30, 2006
Pittsburg	BNSF	June 16, 2006
Riverbank	BNSF	June 7, 2006
Anaheim	UP	June 6, 2006
Fresno	UP	June 7, 2006
Martinez	UP	June 16, 2006
Milpitas	UP	June 8, 2006
Montclair	UP	June 5, 2006
Portola	UP	June 14, 2006
Yermo	UP	May 31, 2006

Table 10
Inspection Results Summary

Air Basin	# of Railyards Visited	Total Number of Locomotives Inspected	Non-Idling Locomotives Observed	Idling Locomotives Observed	Notice of Violations
South Coast	14	352	274	78	15
San Joaquin Valley	6	99	78	21	2
Bay Area	5	35	26	9	3
Mojave Desert	3	57	24	33	3
Sacramento Valley	1	122	82	40	1*
Mountain Counties	1	2	1	1	0
San Diego County	1	8	7	1	0
Total	31	675	492	183	24

* Violation of the 20 percent opacity required. Must be taken out of service in 96 hours.

3. Inspection Results and Preliminary Findings

The railyard inspections conducted from May 8, 2006, through June 16, 2006 resulted in the issuance of 24 NOVs. Nearly 700 locomotives were observed in the railyards, which approaches the estimated 1,000 Class I freight locomotives operating in California on any given day, and with an NOV or non-compliance rate of about 4 percent.

The ARB inspections of railyards resulted in the identification of some new implementation issues that will require further investigation and discussion. For example, there have been situations where idle reduction devices have exhibited unexpected behaviors during in-service operation. ARB inspectors and railroad employees have discovered that idle reduction devices have been programmed by the manufacturer to limit the number of shutdown and restart cycles (8 for General Electric and 6 for EMD) cycles within a 24 hour period. If the number of shutdown and restart cycles is exceeded within a 24 hour period the idle reduction device programming prohibits further engine shutdowns until 24 hours have elapsed. Preliminary information indicates this was done to minimize wear and tear on engine components (e.g., starter and battery). Staff is working with the railroads to determine operational and system changes that can be implemented to identify how often these system limitations occur and how the number of these occurrences can be reduced.

Also, most trains operate with multiple locomotives, referred to as a consist. For some trains, in addition to the main or lead locomotives, the train includes other locomotives that can be placed at the middle and rear of long trains to help climb steep grades. These additional locomotives are capable of remote-controlled operation in conjunction with the main or lead locomotive. Staff is working with the railroads to determine how idle reduction devices are supposed to work, depending on the kind of configuration or alignment of the locomotives.

Discussions between the staff and the railroads have already begun on how to address these and other implementation issues.

III. OTHER IMPLEMENTATION EFFORTS

A. Modernization of the Locomotive Fleet

ARB and others have taken a number of actions to address the impacts of locomotive emissions throughout the State. This includes the 1998 Memorandum of Understanding with the railroads to reduce locomotive oxides of nitrogen (NOx) emissions in the South Coast, requirements for the use of cleaner fuel in intrastate locomotives, Carl Moyer funding by some local air districts, and the current Agreement. As a result, the railroads have undertaken a number of steps that will provide significant reductions in the emission impacts of railyards on local communities. Without the cooperative efforts between the railroads and the ARB, many of these actions would not have occurred.

Since early 2005, UP and BSNF has each operated an electric hybrid locomotive (commonly known as the “Green Goat”, manufactured by Railpower) at the Fresno and Los Angeles railyards. In August 2005, UP announced that it had ordered ten additional Green Goats for use in their southern California railyards. The first two of this order have been received and put into service at the UP railyard in Mira Loma. The remaining eight Green Goats will be put into service in the second half of 2006, which will result in a statewide fleet for UP and BNSF of 12 Green Goats. Green Goats are electric hybrid switch locomotives that operate primarily through energy provided by over 300 lead acid batteries. A mid-sized diesel fueled engine, typically less than 300 horsepower (hp), runs a generator that maintains the charge for this large battery pack. Staff estimates that the replacement of an existing switch locomotive with a Green Goat, in combination with other locomotive emission reduction strategies already in place, will provide about a 90 percent reduction in NOx and diesel particulate matter emissions relative to the unit being replaced.

In January 2006, UP held a public event at the Roseville railyard to present a low emissions gen-set switch locomotive. Depending on the configuration, a gen-set switcher locomotive can contain up to three federally certified lower horsepower (hp) (about 700 hp) Tier 2 or 3 nonroad engines which replace a more traditional larger horsepower (about 2000 hp) single engine. Since switch locomotives typically operate in the lower notch settings, gen-set switcher locomotives are often able to operate on only one engine. This provides for reduced fuel consumption and emissions. However, as more power is needed, they have the ability to utilize all on-board engines. A gen-set switch locomotive will, in combination with other locomotive emission reduction strategies already in place, provide about a 90 percent reduction in NOx and diesel particulate matter emissions relative to the units being replaced. The deployment of significant numbers of these locomotives in California is underway. UP has ordered 60 gen-set switch locomotives; 30 will arrive in late 2006 and the other 30 will arrive in early 2007. UP has invited public input on which railyards to locate the gen-set switch locomotives in the South Coast Air Basin. By mid-2007, an additional nine gen-set switch locomotives are anticipated to be located in northern California for both BNSF and UP which were co-funded under ARB’s Carl Moyer Program.

B. Designated and Covered Railyard Visits

ARB railroad program staff completed visits to the designated railyards by March 2006, and visited seven of the covered railyards in 2006 (see Table 11). The purpose of these visits was to observe the overall operations, relative level of activity, and the proximity of residences and other businesses at each railyard.

Table 11
Covered Railyard Site Visits

Railyard	Operator	Date of Visit
Bakersfield	BNSF	May 11, 2006
Fresno (Calwa)	BNSF	TBD
La Mirada	BNSF	TBD
Needles	BNSF	February 16, 2006
Pico Rivera	BNSF	TBD
Pittsburg	BNSF	June 16, 2006
Riverbank	BNSF	TBD
Anaheim	UP	May 12, 2006
Fresno	UP	TBD
Martinez	UP	June 16, 2006
Milpitas	UP	TBD
Montclair	UP	May 12, 2006
Portola	UP	TBD
Yermo	UP	February 17, 2006

TBD= To be determined at a future date.

C. Community Complaint Process

This section discusses the railroads' implementation efforts to establish and implement a community complaint process for idling and smoking locomotives.

1. Pre-existing Railroad Complaint Process

Prior to the implementation of the Agreement, each railroad had established procedures to process, handle, and respond to community complaints. Under these procedures, each railroad utilizes a national phone call center to receive and record complaints regarding its operations instead of individual local phone centers. The national phone systems allow the railroads to utilize a centrally trained staff and existing mechanisms that allows the public to register complaints about idling or smoking locomotives from all locations in the state at any time. The systems operate 24 hours a day and 365 days a year, and utilizes computerized mechanisms to track and forward complaints to the appropriate company staff to respond.

The call center phone numbers for each railroad are:

- **Union Pacific Railroad**
1-888-UPRR COP or 1-888-877-7267

- **BNSF Railway**
1-800-832-5452

While each railroad's call center system is different, they are similarly structured in that calls received are logged and appropriate railroad employees are directed to respond.

2. Establishment of Railroad Complaint Process Under the Agreement

By August 31, 2005, both railroads submitted their plans to develop a process for informing members of the community on the results of their investigations of complaints. Under their programs, the railroads utilize their existing call centers and phone numbers for community members to report locomotive complaints by augmenting their national systems to be able to respond to and provide complaint resolution information to complainants. Each complaint is logged in a central database upon receipt, and generates a complaint report, which is forwarded to the appropriate railroad operations, environmental, or safety management personnel. Management reviews the complaints and based on the type of complaint and need for action, assigns the appropriate local railroad staff to investigate the complaint and correct the problem. Daily emails are now being automatically generated to environmental staff that must follow-up on the incidents and, in some cases, provide a response back to the individual who reported the complaint. The transition to the new system-wide protocols has been developed and implemented. It will take time to evaluate and make any necessary program adjustments.

Staff intends to continue to work with the railroads to evaluate the existing processes, and develop recommendations on how the system can be more responsive and accountable. This includes the establishment of protocols for better system tracking and recording of the complaint investigation process at the local level, and protocols for notifying individuals who file a complaint on the findings of the railroads' investigations, including any corrective actions taken.

3. Development of an ARB Railyard Website

On August 1, 2005, staff established a "Railyard Emission Reduction" website at: <http://www.arb.ca.gov/railyard/railyard.htm>. This website is intended to provide information to the public about the ARB's ongoing efforts to reduce the emission impacts of railyard operations, including staff's activities to implement the Agreement and other related railroad information.

D. Other Outreach Efforts

Besides the community meetings required under the Agreement, the railroads have initiated a number of other outreach activities and events with the public. Table 12 lists some examples of these outreach activities.

Table 12
Railroads Other Outreach Events

Date	Outreach Event
8/23/05	City of Commerce Taskforce tour of BNSF Commerce yard.
9/13/05	BNSF demonstration of Green Goat, Tier 2 locomotives, and idle reduction equipment at Commerce.
9/13/05	UP demonstrations of Green Goat and Tier 2 locomotives at Sacramento.
1/10/06	UP introduction of gen-set switcher technology in northern California (Roseville).
1/12/06	UP meeting with Center for Community Action and Environmental Justice (CCA EJ) representatives at Mira Loma for update on gate study.
1/19/06	UP introduction of gen-set switcher technology in southern California at City of Industry.
1/31/06	Tours of UP Intermodal Container Transfer Facility yard and gen-set switcher as part of Faster Freight Conference.
4/26/06	Technology Symposium - The first public meeting to discuss potential future emission control measures to reduce railroad emissions as part of the Statewide Rail Yard Agreement.
5/9/06	Tour of UP Mira Loma railyard and gen-set switcher for community representatives.
5/31/06	Tour of UP Oakland railyard for community members.
5/31/06	Meeting with Port of Los Angeles Chairman Freeman at UP Intermodal Container Transfer Facility and display of gen-set switcher and Tier 2 locomotives.
7/13/06	Technology Symposium - The second public meeting to discuss potential future emission control measures to reduce railroad emissions as part of the Statewide Rail Yard Agreement.